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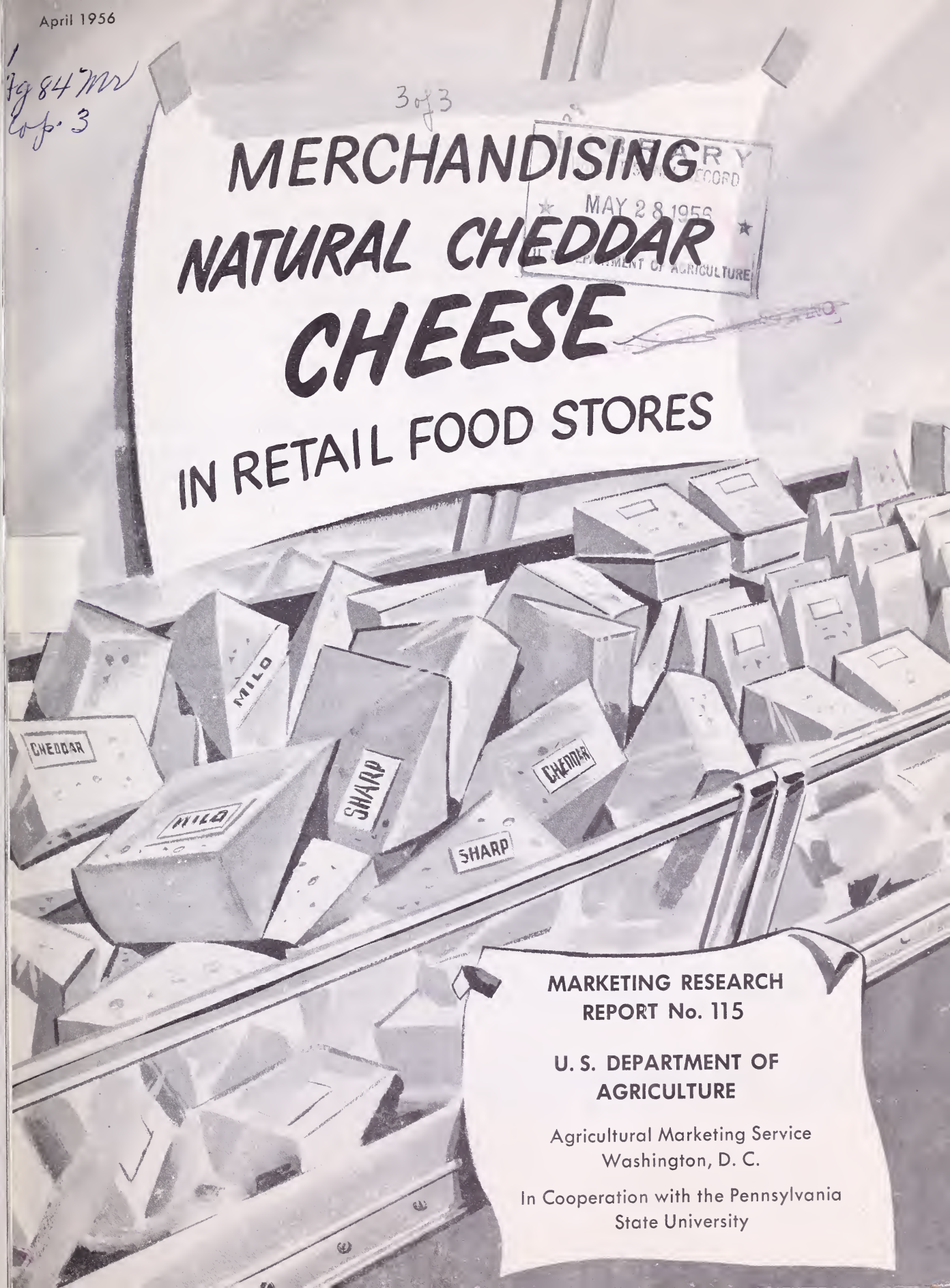
MERCHANDISING NATURAL CHEDDAR CHEESE IN RETAIL FOOD STORES



MARKETING RESEARCH REPORT No. 115

U. S. DEPARTMENT OF AGRICULTURE

Agricultural Marketing Service
Washington, D. C.

In Cooperation with the Pennsylvania State University

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The cooperation of the Kroger Company in making available its retail stores in Pittsburgh, Pa., as a laboratory made this merchandising research possible. Special appreciation is due the Kroger Company Research Department, Cincinnati, Ohio, and the Produce Merchandising Department of the Pittsburgh Branch of the Kroger Company.

The Amalgamated Food Employees' Union, Local No. 590, Pittsburgh, Pa., cooperated in this research by waiving union membership requirements for the enumerators who collected the retail store data and maintained the displays in the experimental stores.

The study on which this report is based was conducted by the Market Development Branch, Marketing Research Division, Agricultural Marketing Service, under the authority of the Agricultural Marketing Act of 1946, with the cooperation of the Pennsylvania State University.

Related reports issued by the Department:

AMS-18. Merchandising Studies in Supermarkets--Apples, Lettuce, and Tomatoes (A Preliminary Report), by Hugh M. Smith. March 1955. 9 pp.

MRR-102. Merchandising Winter Pears in Retail Food Stores, by Hugh M. Smith, Wendell E. Clement, and William S. Hoofnagle. September 1955. 17 pp.

MRR-111. Merchandising Selected Food Items in Grocery Stores--Canned Red Sour Cherries, Carrots, and Bananas, by Hugh M. Smith, Wendell E. Clement, and William S. Hoofnagle. February 1956. 21 pp.

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price 10 cents

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SUMMARY

Four alternative methods of displaying natural Cheddar cheese were compared in the Pittsburgh, Pa., market during the spring of 1955. The merchandising experiment was conducted during an 8-week period in 12 retail food stores.

The largest volume of sales resulted when the cheese was displayed in 2 forms--cheese prepackaged in consumer packages before shipment to the stores and cheese packaged in the stores--and in 5 weight ranges varying from about 6 ounces up to 2 pounds. When this display method was used, sales of all Cheddar cheese--including both experimental and nonexperimental displays in the same display case--were 20 percent larger than the average of sales when three other display methods were used. The other display methods were: (1) Cheese packaged in the stores (referred to in this report as "in-store packaged cheese"), with weights varying up to 1 pound; (2) in-store packaged cheese, with weights up to 2 pounds; and (3) a combination of in-store packaged cheese and cheese prepackaged in consumer packages before shipment to the stores in packages ranging from 6 ounces up to 1 pound.

The overall space devoted to natural Cheddar generally remained constant within each store; the proportion devoted to experimental lots varied in accordance with the method being tested. The size of display for experimental lots was doubled in those merchandising methods which combined in-store packaged cheese and prepackaged cheese.

When formal and jumbled displays were compared, little difference in sales was noted. The same amount of space was used for both types of display.

The only visible difference in the packages of in-store packaged cheese and prepackaged cheese was in the labels--cheese packaged in the store carried the label of the chain store, and prepackaged cheese was identified by State of origin. When both types of packages were displayed, 34 percent of the total sales were prepackaged cheese, even though the price of this cheese was 10 cents a pound higher than the price of the in-store packaged cheese. For in-store packaged cheese, the most popular packages, measured by quantities sold, weighed from 10.1 to 14 ounces. For prepackaged cheese, most frequent purchases were packages ranging from 6 to 10 ounces in size. Popularity of these small packages, in contrast to the larger packages of in-store packaged cheese, may be accounted for in part by the smaller cash outlay. About 85 percent of the total number of packages of Cheddar cheese sold were packages weighing up to 1 pound.

Although the price of sharp Cheddar cheese was 20 cents a pound higher than the price of mild Cheddar cheese, 57 percent of the quantity sold in experimental lots was sharp cheese. Consumer response to sharp and mild cheese, measured in terms of pounds sold, did not vary much by stores or by weeks.

The research indicated that, under comparable conditions, sales of Cheddar cheese may be stimulated by: (1) Providing consumers with an opportunity to purchase both in-store packaged and prepackaged cheese; (2) making cheese available to consumers in packages varying in weights up to 2 pounds, but restricting the larger packages to perhaps 15 percent of the total number of packages displayed; and (3) allocating, in most instances, slightly more display space to sharp cheese than to mild cheese.

MERCHANDISING NATURAL CHEDDAR CHEESE IN RETAIL FOOD STORES

by

Hugh M. Smith and Wendell E. Clement, marketing specialists
and
William S. Hoofnagle, agricultural economist

BACKGROUND OF STUDY

In most years since World War II, the per capita production of cheese has exceeded per capita consumption. During this period, the excess of annual production over consumption fluctuated between about 1/2 and 1 pound per capita. 1/ The study reported upon here was designed to obtain merchandising information which would assist in increasing the quantity of cheese purchased by consumers.

The retail institution, because of its position in the distributive channel, offers an important avenue for affecting the movement of dairy products. It is in the retail store that consumers' decisions are largely made as to what to buy and how much. Some studies have indicated that well over half of the buying decisions are made after the consumer enters the store. 2/ Therefore, the merchandising activities of retailers are a most important factor in influencing the consumer's purchase.

It is the function of the retailer not only to serve the buyers' existing wants, but also to stimulate additional and new wants. Stimulating additional or new wants may take the form of inducing a consumer to purchase more of a product than she formerly purchased or to purchase a product she had not thought of buying before she entered the store. The growing trend toward impersonalized serve-yourself selling in retail food stores has made this task more difficult. Sales personnel are no longer at the point of purchase in our modern retail establishments to influence the consumer's decision. Impersonalized selling has focused attention on the increasing need for merchandising techniques that will present commodities to consumers with the persuasiveness formerly provided by sales personnel.

Improved merchandising techniques may take many forms, such as a different size of package, a new type of display, or a different pattern of pricing or advertising. These changes should not, however, be adopted indiscriminately. Each commodity possesses certain characteristics which are peculiar to that commodity. In other words, a merchandising technique that is effective in selling milk may not be effective in selling cream; a practice that sells cheese may not sell butter. Consequently, each factor associated with good merchandising should be evaluated to determine its effect on sales of the particular commodity.

1/ United States Agricultural Marketing Service. The Dairy Situation, 1955 Outlook Issue, p. 14, U. S. Dept. Agr.

2/ "Stop, Look and Buy", Film Department of E. I. Dupont de Nemours and Company, Wilmington, Del.

PROCEDURE

Selected factors believed to be associated with the sales of and consumer demand for natural Cheddar cheese at the retail level were studied by means of controlled experimentation. Factors studied in the experiment included consumer response to cheese offered in varying weights; cheese packaged in the retail store compared with cheese prepackaged in consumer packages before shipment to the store; and cheese displayed in jumbled form compared with cheese arranged in a formal display.

The combination of these factors that would result in the greatest quantity of sales was determined by testing the following merchandising methods in both the formal and the jumbled type of display:

A. In-store packaged cheese with package sizes varying in weight up to 1 pound with 3 weight ranges--6-10 ounces, 10.1-14 ounces, and 14.1-16 ounces.

B. In-store packaged cheese with package sizes varying in weight up to 2 pounds with 5 weight ranges--6-10 ounces, 10.1-14 ounces, 14.1-16 ounces, 16.1-22 ounces, and 22.1-32 ounces.

C. In-store packaged cheese and prepackaged cheese with both types of packages varying in weight up to 1 pound with 3 weight ranges.

D. In-store packaged cheese and prepackaged cheese with both types of packages varying in weight up to 2 pounds with 5 weight ranges.

Different labels were applied to in-store packaged and prepackaged cheese. The former carried the label of the chain store, and the latter was identified by State of origin. Other than labeling, there were no visible differences in type of package or cut between in-store and prepackaged cheese. All of the prepackaged cheese used in the experimental lots came from one area of production. Price to consumers for prepackaged cheese was 10 cents higher per pound than for cheese packaged in the store. This pricing procedure was used in the experiment because it was the normal practice of the stores, and merchandising research follows the principle that experiments be conducted under the same conditions that will exist where the results are to be applied. There was no discount in price for either in-store or prepackaged cheese when larger sized purchases were made.

Consumers were offered a choice of three ranges in package sizes when weights were restricted to 1 pound or less. Five different ranges in package sizes were displayed when cheese was made available in weights up to 2 pounds. Weight ranges were 6-10 ounces, 10.1-14 ounces, 14.1-16 ounces, 16.1-22 ounces, and 22.1-32 ounces.

In the formal display, cheese was arranged neatly in the dairy case; whereas in the jumbled display the cheese was dumped into the case (figs. 1 and 2).

Figure 1.--A formal display of natural Cheddar cheese.

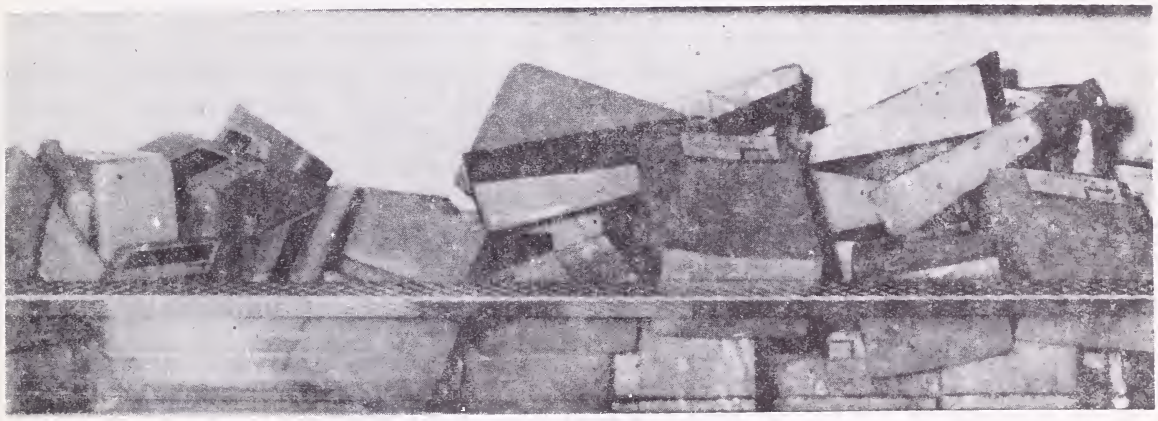

Figure 2.--A jumbled display of natural Cheddar cheese.

Both experimental and nonexperimental lots were included in the space allotted to natural Cheddar. While the overall space devoted to natural Cheddar generally remained constant within each store, the proportion devoted to experimental lots varied in accordance with the method being tested. The size of display for experimental lots was doubled in those merchandising methods utilizing a combination of in-store packaged and prepackaged cheese with a corresponding reduction in the size of display for nonexperimental lots. The method of display for nonexperimental lots did not change during the experiment.

Cheese other than natural Cheddar also was always on display in the dairy case, so that, except for variations in the experimental lots of natural Cheddar, the usual manner of displaying and retailing cheese was not disturbed in the store. Equal quantities of mild and sharp Cheddar were displayed in each merchandising method.

VOLUME OF SALES BY METHODS TESTED

Volume of sales was used to appraise the effectiveness of each of the merchandising methods tested. Results indicated that the most effective method among those tested was the combination display of in-store packaged and prepackaged cheese with package sizes varying in weights up to 2 pounds (method D--table 1). The larger space allocated to the experimental displays consisting of both in-store and prepackaged cheese could be expected to influence the sales resulting from these two methods (C and D). However, the experimental evidence suggests that space was not a dominating factor in the sales results obtained in this study. This is indicated by the fact that the sales of method D were considerably greater than sales of method C, even though both were allotted the same display area. Furthermore, the sales from method C were not significantly greater than sales from methods A and B, even though the display area of the former was twice the display area of the latter two methods. On the other hand, to minimize any possible influence attributable to this variable (space), sales were analyzed for all Cheddar cheese, including experimental and nonexperimental lots; and in this analysis the total space did not change.

Table 1.--Quantity of Cheddar cheese sold by specified methods in 12 retail food chain stores, Pittsburgh, Pa. 1/

Merchandising method	Sales	
	Total	Per 100 customers
	Pounds	Pounds
A. In-store packaged cheese with package sizes varying in weight up to 1 pound with 3 weight ranges	1,188	0.84
B. In-store packaged cheese with package sizes varying in weight up to 2 pounds with 5 weight ranges	1,252	.91
C. In-store packaged and prepackaged cheese with both types of packages varying in weight up to 1 pound with 3 weight ranges	1,436	1.01
D. In-store packaged and prepackaged cheese with both types of packages varying in weight up to 2 pounds with 5 weight ranges	1,798	1.32

1/ Includes 8 test weeks, spring 1955.

For all Cheddar cheese, experimental and nonexperimental lots, with total space for all Cheddar cheese held constant, method D resulted in sales 20 percent greater than the average of sales for the other 3 methods. Statistically, results from methods A, B, and C were not significantly different from each other. The results from method D, however, did differ significantly from the other three. 3/

FORMAL AND JUMBLED DISPLAYS

Formal and jumbled displays were tested an equal number of times with each of the merchandising methods used in the experiment. Sales from the two displays were approximately the same and did not vary significantly between groups of stores. The formal display accounted for 51 percent of the total sales by the two display methods. Evidence from this experiment indicates that the type of display--formal or jumbled--will not materially affect the sales of Cheddar cheese.

SALES OF IN-STORE PACKAGED AND PREPACKAGED CHEESE

In two of the merchandising methods tested, a combination display of in-store packaged and prepackaged cheese was used (methods C and D). Prepackaged cheese accounted for 34 percent of the total sales by these two merchandising methods. Sales of in-store packaged cheese were greater than sales of prepackaged cheese in all stores and in all time periods (fig. 3). The 10-cent price premium for prepackaged cheese may have influenced consumer response in choosing between the two types of packages. Even though consumer response was greater to in-store packaged cheese, results of this research indicated that both types of package should be included in the display, since the utilization of both packages tended to increase overall sales.

UNIT SALES OF CHEDDAR CHEESE

An important part of merchandising is to have the commodity available to consumers in the sizes they prefer. The experiment on cheese included an appraisal of consumer response to packages of cheese in various sizes. The number of purchases by size of package varied, depending upon whether the cheese was packaged in the store or before shipment to the store. When cheese was made available to consumers in in-store packages, the most frequent purchases were packages weighing from 10.1 to 14 ounces (table 2).

3/ A Duncan multiple-comparisons test was used to separate merchandising methods into statistically significant groups. If the methods were to sell equal amounts of Cheddar cheese, on the average the test, as applied, would be expected to reveal significant separations (as it did in this experiment) in only 5 percent of the times used.

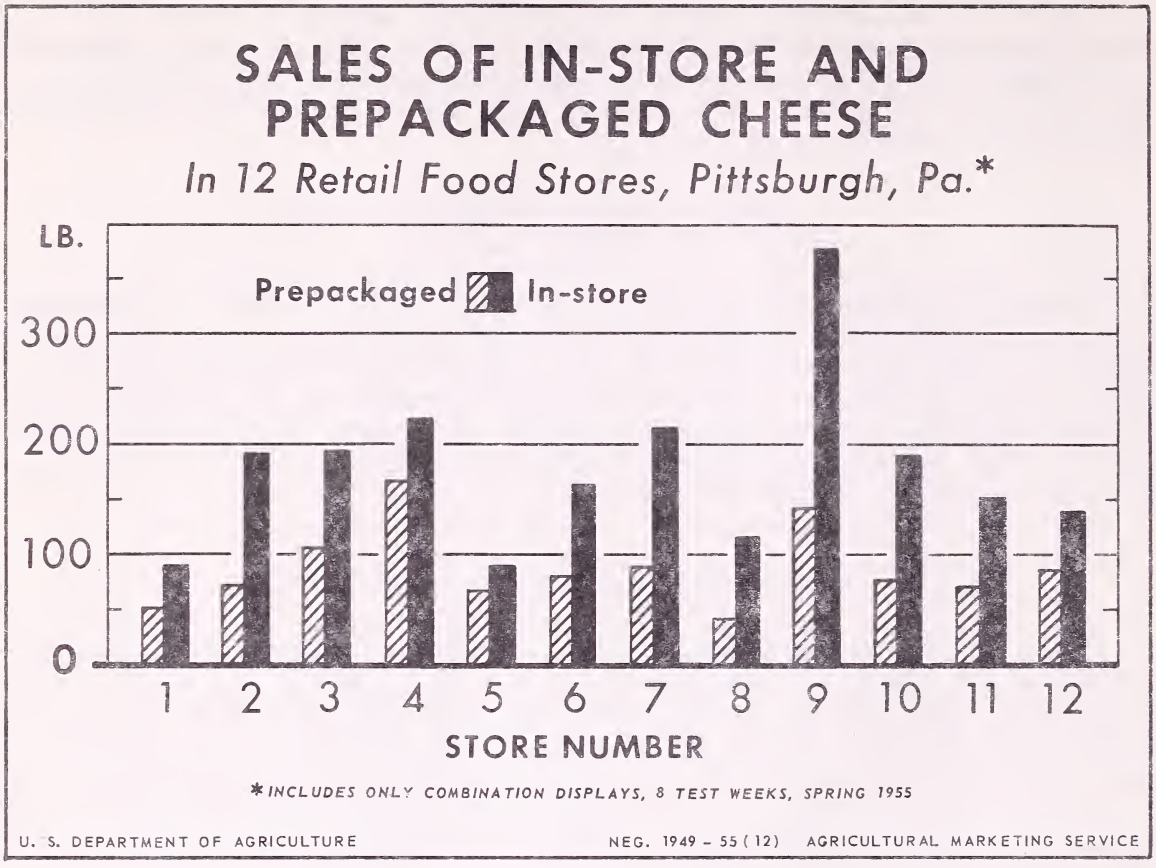
SALES OF IN-STORE AND PREPACKAGED CHEESE
In 12 Retail Food Stores, Pittsburgh, Pa.*
LB.
Prepackaged
In-store
300
200
100
0
1 2 3 4 5 6 7 8 9 10 11 12
STORE NUMBER
*INCLUDES ONLY COMBINATION DISPLAYS, 8 TEST WEEKS, SPRING 1955
U. S. DEPARTMENT OF AGRICULTURE
NEG. 1949 - 55 (12) AGRICULTURAL MARKETING SERVICE

Figure 3

Table 2.--Relative frequency distribution of cheese purchases by type and size of package 1/

Weight range	Type of package			
	In-store weights up to 1 lb.	Prepackaged weights up to 1 lb.	In-store weights up to 2 lbs.	Prepackaged weights up to 2 lbs.
	Percent	Percent	Percent	Percent
6-10 ounces	31	50	24	50
10.1-14 ounces	50	31	47	26
14.1-16 ounces	19	19	14	13
16.1-22 ounces			9	8
22.1-32 ounces			6	3
Total	100	100	100	100

1/ Includes 8 test weeks, spring 1955.

Packages weighing from 6 to 10 ounces were the next most popular for in-store packaged cheese. When in-store packages varying in weight up to 2 pounds were displayed, about 15 percent of the total number of packages sold weighed between 1 and 2 pounds. Sales from the larger sized packages are important because a larger quantity of cheese is moved to consumers with each purchase.

For prepackaged cheese the most popular size of package was in the lowest weight range. Approximately 50 percent of the total number of packages sold weighed from 6 to 10 ounces. As the size of package increased, the number of purchases declined. About 11 percent of the total number of packages sold weighed between 1 and 2 pounds. Greater consumer response to packages in the lowest weight range for prepackaged cheese, as contrasted to in-store packaged cheese, may be partly explained by the difference in price of the two types of packages. The price of prepackaged cheese was 10 cents a pound higher than the price of in-store packaged cheese. The findings from this experiment indicated that consumers tended to purchase in smaller sized units as the price of Cheddar cheese increased.

SALES OF MILD AND SHARP CHEDDAR CHEESE

Each experimental lot of cheese consisted of equal quantities of mild and sharp Cheddar cheese. Although sharp Cheddar cheese retailed for 20 cents more a pound than mild cheese, the sharp cheese accounted for 57 percent of the total sales from experimental lots. Relative consumer response to mild and sharp Cheddar generally followed the same pattern in all stores except one, and in all time periods (fig. 4).

An evaluation of relative consumer response to mild and sharp Cheddar cheese by type of package indicated greater preference for prepackaged sharp cheese than for sharp cheese packaged in the store (table 3).

Table 3.--Relative sales of mild and sharp natural Cheddar by type of package in 12 retail food stores, Pittsburgh, Pa. 1/

Type of package	Mild	Sharp	Total
	Percent	Percent	Percent
In-store packaged	45	55	100
Prepackaged	33	67	100
Weighted average	43	57	100

1/ Includes 8 test weeks, spring 1955.

Consumer response might be different from that indicated in this experiment if mild Cheddar were offered as Longhorn, a style designation which apparently has considerable effect on consumers' decisions. The

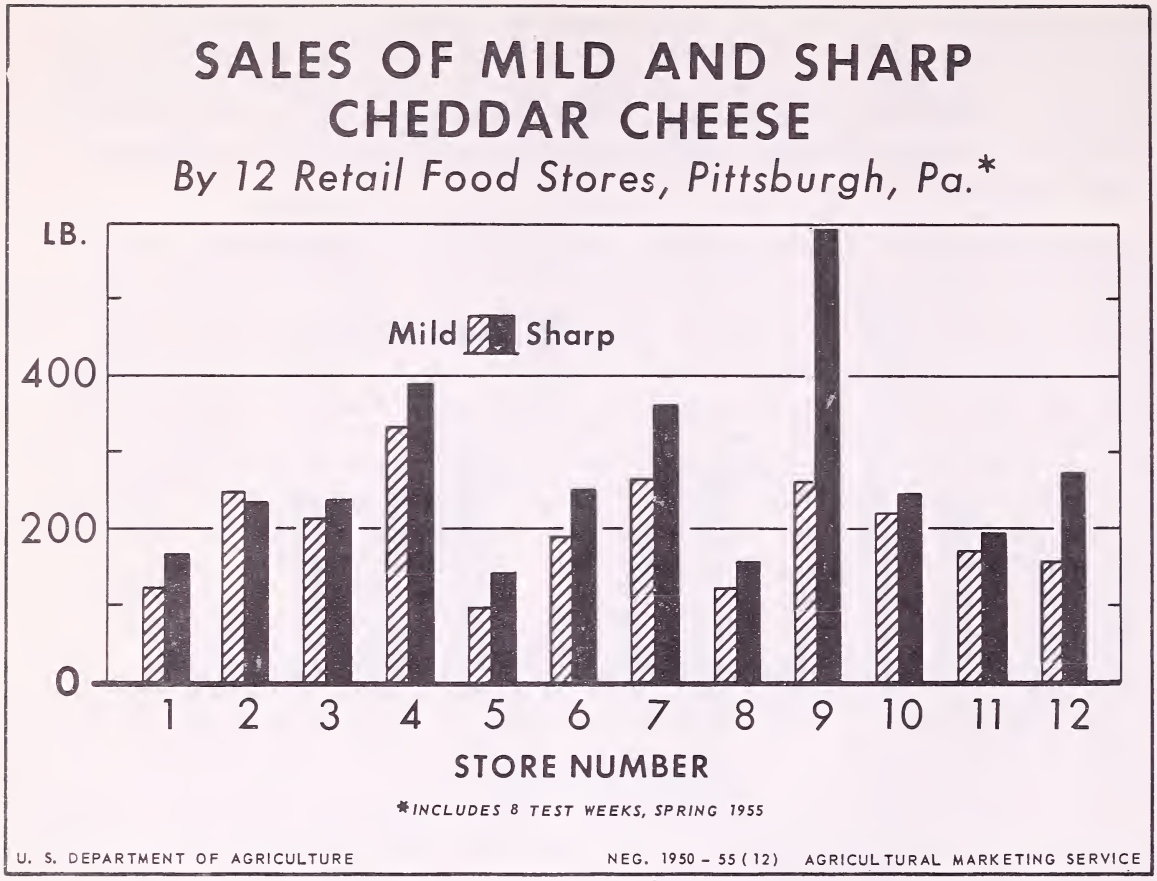
SALES OF MILD AND SHARP CHEDDAR CHEESE
By 12 Retail Food Stores, Pittsburgh, Pa.*
LB.
400
200
0
Mild
Sharp
1 2 3 4 5 6 7 8 9 10 11 12
STORE NUMBER
*INCLUDES 8 TEST WEEKS, SPRING 1955
U. S. DEPARTMENT OF AGRICULTURE
NEG. 1950 - 55 (12) AGRICULTURAL MARKETING SERVICE

Figure 4

consumer's choice under such conditions might be made on the basis of the influence of this designation rather than whether the cheese was mild or sharp. This observation is based on the fact that in the nonexperimental lots sales of Longhorn exceeded those of sharp Cheddar.

APPENDIX

The official test on cheese covered an 8-week period beginning January 31, 1955. The experiment was conducted in 12 self-service retail food stores of a national chain. Data were gathered from these stores under normal operating conditions so as not to create an artificial atmosphere in the market place. In each store consumers were exposed to only one merchandising method at a time. Each method was tested in each of the 12 stores for a period of 2 weeks.

The experiment on cheese was set up on a basic 4 by 4 rotational latin square design, 4/ replicated 3 times through additional stores. The added effects of formal and jumbled displays were measured by superimposing these displays symmetrically upon the basic latin square as shown in table 4. The four basic merchandising methods being tested and the formal and jumbled displays were rotated from store to store to equalize the effects on retail sales of certain nontest variables--differences in size and type of store, differences in preferences of customers among stores, and competition from other products (table 4). The effect of seasonality in demand on retail sales was equalized by testing each merchandising method and the formal and jumbled displays in the same number of stores during each time period. The effect of merchandising methods on the quantity of cheese sold from the formal and jumbled displays was equalized by rotating the formal and jumbled displays among the four merchandising methods.

The effect of certain other variables on volume of sales was minimized by holding them constant throughout the experiment in all test stores. The location of the display of cheese was kept constant throughout the test periods by arrangement with officials of the chain store. Pricing and advertising policies for the commodity tested were uniform for all stores included in the experiment. In addition, changes in retailing procedures for competing products were likewise kept as uniform as possible. Retailing practices applying both to experimental and nonexperimental commodities were coordinated in all stores.

One enumerator was assigned part time to each store to maintain the displays in the prescribed manner for each merchandising method, according to the rotation schedule. In addition, the enumerator collected data on sales and obtained a cash register count of those customers potentially exposed to the merchandising method being tested. Enumerators did not interfere with the consumer's choice of cheese in any way.

The analysis of variance technique 5/ was used in analyzing the data to obtain and assign the existing variation to specific components. In this study the components were time periods, stores, merchandising methods, displays, and experimental error. The variation attributable to each of these components is indicated in tables 5 and 6. The significance or nonsignificance of each component on the data was determined by taking the ratio of the mean square of each component to the appropriate error term.

A Duncan test 6/ was used to separate sales by the various merchandising methods into significantly different groups.

4/ Cochran, W. G., and Cox, G. M., Experimental Designs. John Wiley and Sons, Inc., New York, 1950, pp. 103-112.

5/ Snedecor, George W., Statistical Methods. The State College Press, Ames, Iowa, 1944, pp. 271-85.

6/ Duncan, D. B. Multiple Range and Multiple F. Tests. Va. Agr. Expt. Sta., Va. Polytechnic Institute, Blacksburg, Va., Technical Report No. 6a, September 1953.

Table 4.--Experimental design for cheese, Pittsburgh, Pa., spring, 1955

Time period 1/	Merchandising method 2/ tested in store number--			
	1	2	3	4
1st	AF	BF	CJ	DJ
2d	BJ	CJ	DF	AF
3d	CF	DF	AJ	BJ
4th	DJ	AJ	BF	CF
	5	6	7	8
1st	AF	BF	CJ	DJ
2d	BJ	CJ	DF	AF
3d	CF	DF	AJ	BJ
4th	DJ	AJ	BF	CF
	9	10	11	12
1st	AJ	BJ	CF	DF
2d	BF	CF	DJ	AJ
3d	CJ	DJ	AF	BF
4th	DF	AF	BJ	CJ

1/ Each time period consisted of 2 weeks.
2/ Code letters refer to merchandising methods as follows:
A. In-store packaging, weights up to 1 pound.
B. In-store packaging, weights up to 2 pounds.
C. In-store packaging and prepackaging, weights up to 1 pound.
D. In-store packaging and prepackaging, weights up to 2 pounds
The suffix F or J with each merchandising code letter (A through D) indicates that the merchandising method was tested with the added effect of either a formal or jumbled display.

Table 5.--Analysis of variance table for determining significance of effects of stores, time periods, displays, and merchandising methods on the quantity of Cheddar cheese sold from experimental lots in 12 retail food stores in Pittsburgh, Pa.

Source of variation	Degree of freedom	Mean square
Stores:		
Between groups	2	4,558
Within groups	9	9,468
Treatments	3	6,244 1/
Treatments x groups	6	601
Time periods	3	676
Time periods x groups	6	364
Displays (jumbled and formal)	1	54 2/
Displays x groups	2	987
Error	15	766

1/ This mean square with 3 degrees of freedom tested against the error mean square with 15 degrees of freedom is significant at the 1-percent probability level.

2/ This mean square with 1 degree of freedom tested against the error mean square with 15 degrees of freedom is not significant.

Table 6.--Analysis of variance table for determining significance of effects of stores, time periods, displays, and merchandising methods on the quantity of all Cheddar cheese sold from experimental and nonexperimental lots in 12 retail food stores in Pittsburgh, Pa.

Source of variation	Degree of freedom	Mean square
Stores:		
Between groups	2	35,115
Within groups	9	47,796
Treatments	3	11,723 1/
Treatments x groups	6	4,848
Time periods	3	8,103
Time periods x groups	6	1,827
Displays (jumbled and formal)	1	1,408 2/
Displays x groups	2	45
Error	15	2,239

1/ This mean square with 3 degrees of freedom tested against the error mean square with 15 degrees of freedom is significant at the 5-percent probability level.

2/ This mean square with 1 degree of freedom tested against the error mean square with 15 degrees of freedom is not significant.

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